

REMARKS

In this amendment, applicants have amended claim 29. Accordingly, claims 1-53, 55, 56, 58, and 62-64 are presented for reconsideration.

Claim Rejections – 35 USC § 112

Claim 29 stands rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended claim 29 to address this rejection, and submit that, as amended, claim 29 does particularly point out and distinctly claim the subject matter which applicant regards as the invention. Accordingly, applicants ask the Examiner to withdraw the rejection of claim 29 under 35 USC § 112.

Claim Rejections – 35 USC § 101

Claims 1-43, 53, 55-56, and 62-64 stand rejected under 35 USC § 101 as allegedly being directed to non-statutory subject matter. Applicants traverse for the following reasons.

Independent Claim 1 is directed to a method that requires:

- ... measuring a location, x_1 , of a stage along a first measurement axis using an interferometer;

- measuring a location, x_2 , of the stage along a second measurement axis substantially parallel to the first measurement axis; and

- determining a location of the alignment mark along a third axis substantially parallel to the first measurement axis based on x_1 , x_2 , and a correction term, ψ_3 ,

- wherein the interferometer comprises interferometer optics configured to direct a measurement beam to reflect from a mirror where the interferometer optics or the mirror are attached to the stage, and ψ_3 is calculated from predetermined information comprising information characterizing imperfections in the interferometer optics.

The Examiner, citing to OG Notices: 22 November 2005 "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility", states that

"[m]erely determining the location of the alignment mark ... would not appear to be sufficient to constitute a tangible result, since the outcome of the determining ... [step] has not been used in a such a manner that its usefulness in a disclosed practical application nor made available in a such a manner that its usefulness in a disclosed practical application can be realized" (Office Action, page 2). Applicants respectfully disagree.

The Examiner's position with respect to claim 1 is in direct conflict with Federal Circuit precedent. In Arrhythmia Research Technology Inc. v. Corazonix Corp., 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir.1992), the Federal Circuit held that a method claim that directed to "determining" information satisfied the requirements of § 101. The claim at issue in Arrhythmia recited:

[a] method for analyzing electrocardiograph signals to determine the presence or absence of a predetermined level of high frequency energy in the late...signal, comprising the steps of: converting a series of...signals to time segments, each segment having a digital value equivalent to the analog value of said signals at said time; applying a portion of said time segments in reverse time order to high pass filter means; determining an arithmetic value of the amplitude of the output of said filter; and comparing said value with said predetermined level.

Id. at 1055 (emphasis added). The Arrhythmia court held that this claim meets the requirements of § 101 because:

[w]hile many steps in the... process involve the mathematical manipulation of data...the claims do not disclose mere abstract ideas, but a practical ... process.

Id. at 1065-66 (emphasis added). This reasoning has been reaffirmed more recently by the Federal Circuit:

[In Arrhythmia]...the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete or tangible thing--the condition of a patient's heart.

State Street Bank & Trust Co. v. Signature Financial Group, 149 F.3d 1368, 38 USPQ2d 1530 (Fed. Cir. 1998).

Applicants' claim 1 is directly analogous to the Arrhythmia claim. Both claims recite acquiring information related to a physical system. Compare, for example, the locations x_1 and x_2 of applicants' claim with the electrocardiograph signals in the Arrhythmia claim. Both represent a quantity of practical interest corresponding to useful, concrete and tangible thing. Moreover, both claims include steps that involve manipulation of data representing a quantity of practical interest corresponding to useful, concrete and tangible thing. Compare "determining a location of the alignment mark along a third axis" in applicant's claim with "determining an arithmetic value of the amplitude of the output of said filter; and comparing said value with said predetermined level." Thus applicant's claim, like the Arrhythmia claim, discloses not merely an abstract idea, but a patentable, practical process.

The Examiner also suggests that, without more, applicants' claimed process does not produce a sufficiently tangible result to satisfy the requirements of § 101. Again, this suggestion is in direct conflict with Federal Circuit precedent. In State Street Bank & Trust Co. v. Signature Financial Group, the Federal Circuit concluded that

...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes. 149 F.3d at 1373 (emphasis added).

Thus, a method which results solely in a mathematically determining a quantity can in fact satisfy § 101 if the result is sufficiently "a useful, concrete and tangible." Applicants submit that the "location of the alignment mark along a third axis" determined by their method is certainly no less useful, concrete, and tangible than the final share price determined by the State Street invention. The determined information is a quantity which corresponds to concrete properties of a physical system. This quantity provides useful information about, for example, the measurement object. Once determined, the information is, like the final share price of State Street at least momentarily fixed for

recording, reporting, or other purposes. Therefore, the claimed method produces a useful, concrete, and tangible result.

In light the Federal Circuit precedent described above, applicants respectfully submit that their method in claim 1 satisfies the requirements of § 101 because, taken as a whole, the method constitutes a practical application. This conclusion is in accord with Supreme Court precedent which holds that:

...when a claim containing [an abstract idea] implements or applies that [idea] in a ...process which, when considered as a whole, is performing a function which the patent laws were designed to protect...the claim satisfies the requirements of Sec. 101.

Diamond vs. Diehr, 450 U.S. 175, 192 (1981). Moreover, this conclusion is in accord with the Patent Office's Interim Guidelines cited by the Examiner, which state that:

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a Sec. 101 judicial exception, in that the process claim must set forth a practical application of that Sec. 101 judicial exception to produce a real-world result. *Benson*, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application."). "[A]n application of a law of nature or mathematical formula to a ... process may well be deserving of patent protection." *Diehr*, 450 U.S. at 187, 209 USPQ at 8 (emphasis added); see also *Corning*, 56 U.S. (15 How.) at 268, 14 L.Ed. 683 ("It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted . . ."). In other words, the opposite meaning of "tangible" is "abstract."

OG Notices: 22 November 2005 "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" § IV (C) (2) (b) (2) (emphasis added). Applicants therefore ask the Examiner to withdraw the rejection of claim 1 under 35 U.S.C. § 101.

Claims 2-16, 53, 55, 56, and 58 depend, either directly or indirectly, from claim 1. Applicants submit therefore that these claims cover patentable subject matter under § 101 for at least the same reasons as claim 1. Applicants respectfully ask the Examiner to also withdraw his rejection of these claims.

Applicants further submit, for similar reasons to those set forth above with respect to the claim 1, the methods of independent claims 17, 30, and 40 are also directed to statutory subject matter under 35 U.S.C. § 101. Applicants there ask the Examiner to withdraw the rejection of these claims under 35 U.S.C. § 101.

Claims 18-29 and 62-64 depend, either directly or indirectly, from claim 17. Applicants submit therefore that these claims cover patentable subject matter under § 101 for at least the same reasons as claim 17. Applicants respectfully ask the Examiner to also withdraw his rejection of these claims.

Claims 31-39 depend, either directly or indirectly, from claim 30. Applicants submit therefore that these claims cover patentable subject matter under § 101 for at least the same reasons as claim 30. Applicants respectfully ask the Examiner to also withdraw his rejection of these claims.

Claims 41-43 depend, either directly or indirectly, from claim 40. Applicants submit therefore that these claims cover patentable subject matter under § 101 for at least the same reasons as claim 40. Applicants respectfully ask the Examiner to also withdraw his rejection of these claims.

Claim Rejections – 35 USC § 103

Claims 1-4, 10-12, 17-23, 25-27, 30, 36, 38, 39, 44-53, 55, and 62-64 stand rejected as allegedly being obvious over Kamiya (US 5,790,253) in view of Badami et al. (US 6,181,420), where claims 1, 17, 30, and 44 are in independent form.

Regarding claims 1, 17, 30, and 44, the Examiner admits that “Kamiya does not expressly disclose that the imperfections are in the interferometer optics, which directs the measurement beam to a separate mirror”. However, the Examiner relies on Badami et al. to supply that which is missing from Kamiya. Specifically, the Examiner states “Badami et al. disclose correcting for imperfections in the interferometer optics which direct a measurement beam to a separate mirror.” According to the Examiner, “[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to correct

for imperfections in the interferometer optics using [a] device such as Kamiya for determining alignment marks for the purpose of improving the accuracy of position measurements, as described in Badami et al.” (See, e.g., Office Action, pages 4-5 for discussion of claim 1. Corresponding discussion is presented later in the Office Action for the other independent claims.)

Applicants traverse these rejections. In particular, one of ordinary skill would not have been motivated to modify the systems and methods disclosed by Kamiya to include the error correction disclosed by Badami et al. because there is no indication that that the sources of uncertainty addressed by Badami et al.'s methods are an issue in Kamiya's systems. Kamiya is concerned with correcting linearity errors of a moving mirror due to deformations in the mirror (Kamiya, col. 3, lines 33 – 43). In contrast, Badami et al. discloses interferometry systems that minimize cyclic errors caused by unwanted mixing of the measurement and reference beams in the interferometer that occurs in interferometers using polarized beams (Badami et al., col. 1, line 66 – col. 2, line 20). While Badami et al. indicate that beam mixing can be caused by “imperfections in the interferometer components,” Badami et al.'s concern is with imperfections that affect the polarization of the beams in the interferometer. Specifically, Badami et al. states that “beam mixing can be caused by ellipticity in the polarizations of the input beams and imperfections in the interferometer components, e.g., imperfections in the polarizing beam splitter used to direct orthogonally polarized input beams along respective reference and measurement paths” (id., col. 2, lines 4 – 8). Furthermore, methods disclosed by Badami et al. for minimizing cyclic errors involve careful sampling of the polarization of two different output beams (id., lines 19 – 30).

Applicants could find no disclosure that Kamiya's interferometers utilize polarized radiation, much less any indication that cyclic errors are an issue in Kamiya's systems. Accordingly, upon reading Badami et al., a person having ordinary skill in the art would not have been motivated to modify the systems disclosed by Kamiya to compensate for cyclic errors.

The Examiner's rejection of the claims in view of Kamiya and Badami et al. is a hindsight reconstruction, using applicants' claims as a template to reconstruct the invention by picking and choosing isolated disclosures from the prior art. This is impermissible under the law. For example, in In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992), the Federal Circuit stated:

It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." (quoting In re Fine, 837 F.2d at 1075, 5 USPQ2d at 1600)

The present rejections fit the court's description of what may not be done under § 103. The Examiner has merely listed certain components of applicant's invention and then located isolated disclosures of those components. The law requires more than that.

The Examiner must show where the prior art provides a motivation to combine the references he/she has combined in the obviousness rejection. Absent a motivation to combine, obviousness has not been demonstrated. As the Federal Circuit stated in Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934, 15 USPQ2d 1321, 1323 (Fed. Cir. 1990):

It is insufficient that the prior art disclosed the components of the patented device, either separately or used in other combinations; there must be some teaching, suggestion, or incentive to make the combination made by the inventor.

Accordingly, applicants submit that independent claims 1, 17, 30, and 44 are not obvious in view of the combination of Kamiya and Badami et al., and ask that the rejection of these claims under 35 USC § 103 be withdrawn.

Claims 2-4, 10-12, 53 and 55 depend, either directly or indirectly, from claim 1. Accordingly, these claims should be allowable over the combination of Kamiya and Badami et al. for at least those reasons set forth above with respect to claim 1.

Accordingly, applicants ask the Examiner to withdraw the rejection of these claims under 35 USC § 103.

Claims 18-23, 25-27, and 62-64 depend, either directly or indirectly, from claim 17. Accordingly, these claims should be allowable over the combination of Kamiya and Badami et al. for at least those reasons set forth above with respect to claim 17. Accordingly, applicants ask the Examiner to withdraw the rejection of these claims under 35 USC § 103.

Claims 36, 38, and 39 depend, either directly or indirectly, from claim 30. Accordingly, these claims should be allowable over the combination of Kamiya and Badami et al. for at least those reasons set forth above with respect to claim 30. Accordingly, applicants ask the Examiner to withdraw the rejection of these claims under 35 USC § 103.

Claims 45-52 depend, either directly or indirectly, from claim 44. Accordingly, these claims should be allowable over the combination of Kamiya and Badami et al. for at least those reasons set forth above with respect to claim 44. Accordingly, applicants ask the Examiner to withdraw the rejection of these claims under 35 USC § 103.

Claims 56 and 58 stand rejected as being unpatentable over Kamiya and Badami et al. "further in view of what is well known in the prior art (Official Notice)." However, claims 56 and 58 depend indirectly from claim 1. Accordingly, these claims should be allowable for at least the same reasons set forth with respect to claim 1 above, notwithstanding what the Examiner considers well known in the prior art. Applicants ask that the rejection of claims 56 and 58 under 35 USC § 103 be withdrawn.

Regarding claims 44-52, the Examiner states that "[the] remaining claim limitations found in [these claims] are functional limitations and these limitations can be met by the prior art if the structure of the prior art is capable of performing the claimed functions" (Office Action, page 14). Applicants are unsure of exactly which limitations the Examiner is referring to as these claims, including what appears to be all their limitations, were addressed earlier in the Office Action (see Office Action, pages 9-12).

Nevertheless, applicants in no way concede that the Examiner's interpretation regarding functional limitations is consistent with the position of the Federal Circuit and ask the Examiner to clarify this statement in the event that the rejection of these claims in view of the combination of Kamiya and Badami et al. is maintained.

Double Patenting

The action also provisionally rejected claims 1-61 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of copending Application No. 10/630,361. Claims 54, 57, and 59-61 are cancelled so the rejected of these claims should be withdrawn. Regarding claims 1-53, 55, 56, and 58, because the double patenting rejection is provisional, we ask the Examiner to hold the rejection in abeyance until such time that the double patenting rejection is the only remaining rejection, or until the claims in Application No. 10/630,361 are allowed.

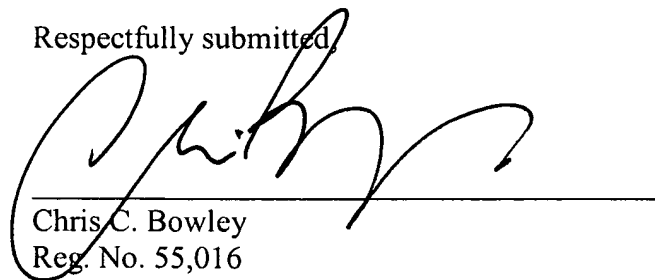
Conclusion

Applicants submit that all claims are in condition for allowance, which action is requested. Enclosed is a \$450 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Date: _____

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Respectfully submitted,



Chris C. Bowley
Reg. No. 55,016

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110
Telephone: (617) 542-5070
Facsimile: (617) 542-8906